CLAIMS

What is claimed is:

1. A polycrystalline silicon thin film to be used in display devices, the thin film comprising adjacent primary grain boundaries that are not parallel to each other, wherein an area surrounded by the primary grain boundaries is larger than 1 μm^2.

2. The polycrystalline silicon thin film according to claim 1, wherein the primary grain boundaries are formed in a closed curve shape or a closed polygonal shape.

3. The polycrystalline silicon thin film according to claim 1, wherein the primary grain boundaries are formed in a rectangular or a hexagonal shape.

4. The polycrystalline silicon thin film according to claim 1, wherein the primary grain boundaries are symmetrical to each other centering around a certain axis passing through the primary grain boundaries.

5. The polycrystalline silicon thin film according to claim 4, wherein the primary grain boundaries form a hyperbola centering around a radial shape or the certain axis.

6. A thin film transistor fabricated using the polycrystalline silicon thin film according to claim 1.

7. The thin film transistor according to claim 6, wherein the thin film transistor is used in an organic electroluminescent display device.

8. A method of fabricating a polycrystalline silicon thin film to be used in display devices, the method comprising crystallizing amorphous silicon by a laser using a mask comprising a laser transmission region in which line shaped laser transmission patterns and laser non-transmission patterns are mixed.

9. The method according to claim 8, wherein the laser transmission region comprises a plurality of line shaped pattern groups, wherein the line shaped patterns in each group are formed in a long rectangular shape and in parallel, and adjacent line pattern groups are spaced apart from each other at a certain distance and staggered so as to be offset from one another.

10. The method according to claim 8, wherein the laser non-transmission region comprises a plurality of line shaped pattern groups arranged perpendicularly to each other.

11. The method according to claim 8, wherein the laser non-transmission region further comprises circular or dot shaped mask patterns.

12. The method according to claim 11, wherein the circular or dot shaped mask patterns are arranged in circular, triangular, rectangular or hexagonal shapes.

13. The method according to claim 8, wherein the line shaped laser transmission patterns are wider than the laser non-transmission patterns.

14. The method according to claim 11, wherein the circular or dot shaped mask patterns are irregularly arranged.

15. A fabrication method of a polycrystalline silicon thin film to be used in display devices, the method comprising crystallizing amorphous silicon by a laser using a mask in which laser transmission patterns are mixed with laser non-transmission patterns, wherein the laser non-transmission patterns are circular or dot shaped opaque mask patterns.

16. The fabrication method according to claim 15, wherein the circular or dot shaped opaque mask patterns are arranged in circular, triangular, rectangular or hexagonal shapes.

17. The fabrication method according to claim 15, wherein the circular or dot shaped opaque mask patterns are irregularly arranged.

18. A polycrystalline silicon thin film to be used in display devices, wherein the polycrystalline silicon thin film is fabricated by the method of claim 15.

19. The polycrystalline silicon thin film according to claim 18, wherein the polycrystalline silicon thin film is used in an organic electroluminescent display device.

20. A polycrystalline silicon thin film to be used in display devices, wherein the polycrystalline silicon thin film is fabricated by the method of claim 8.

21. The polycrystalline silicon thin film according to claim 20, wherein the polycrystalline silicon thin film is used in an organic electroluminescent display device.

22. A method of fabricating a polycrystalline silicon thin film, the method comprising crystallizing amorphous silicon using a mask in which line shaped patterns are mixed with circular or dot shaped patterns, wherein the polycrystalline silicon thin film has various shaped grain structures.

23. A thin film transistor comprising a polycrystalline silicon thin film having various shaped grain structures, wherein the polycrystalline silicon thin film is fabricated by crystallizing amorphous silicon using a mask in which line shaped patterns are mixed with circular or dot shaped patterns, and wherein the performance characteristics of the thin film transistor are independent of a channel direction in relation to crystal grain boundaries.